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Contact: Erin Lee

Homeland Security & Technology

(202) 624-5392 or elee@nga.org

State Strategies for Accelerating Enhanced 9-1-1 Implementation

Executive Summary

The deployment of wireless Enhanced 9-1-1 (E9-1-1) service is among the most urgent Homeland Security enhancements states currently face. E9-1-1 automatically directs a wireless call to the appropriate 9-1-1 center, or public safety answering point (PSAP), and identifies a caller's location in an emergency. The ability to receive E9-1-1 calls and direct emergency services to the caller's location are a necessity for first responders. Recognizing the critical need to improve 9-1-1 service, the Federal Communication Commission (FCC) passed rules in 1996 (Report and Order 94-102) that required all wireless carriers to provide pinpoint location information to the PSAPs or 9-1-1 dispatch centers by December 31, 2005.

Wireless carriers have to provide location information, either by means of software within the wireless handsets or by means of their networks, while the PSAPs have to install and/or upgrade equipment that would read this location from the wireless caller. While most wireless carriers will meet this goal, many of the nation's 6,000 state and local PSAPs will not be capable of using the location information because they have not been able to upgrade their equipment.

Since most areas in the country will not have wireless E9-1-1 by the December 31, 2005 deadline, Congress is poised to pass legislation that attempts to spur states to implement and sufficiently fund E9-1-1. Proposed legislation would provide matching grants only to those states that have designated a single officer or governmental body as the statewide E9-1-1 coordinator and established an implementation plan. It would also require the FCC to audit states' E9-1-1 funds twice a year in an attempt to make certain that state E9-1-1 funds are distributed to PSAPs. Currently, the House bill has passed and the Senate bill is awaiting final passage.

Consumers are generally unaware of the current limitations of 9-1-1 and expect to have the same service no matter what type of telephone service they use, whether it is wire line, wireless, or voice over the Internet (VOIP). Even though states and localities are not mandated to deploy E9-1-1, citizens expect this vital service.

The purpose of this paper is to provide an overview of several state strategies that Governors may wish to consider to achieve E9-1-1 service delivery goals in their own states. Strategies include:

- *Designate a statewide coordinator who has authority and oversight of resources to effectively implement E9-1-1.*
- *Establish a baseline to determine where resources are needed to complete E9-1-1.*
- *Identify opportunities to efficiently fund implementation.*
- *Provide education and outreach to PSAPs to assist them with implementation.*

Enhanced 9-1-1: Definition and Requirements

9-1-1 is the three-digit telephone number assigned throughout the U.S. as the universal number to call for emergency assistance. This number provides direct access to the nation's 6,000 local, county, and state Public Safety Answering Points (PSAP), which either may dispatch the emergency resources for individual calls for assistance or relay the information to the appropriate dispatch service. Basic 9-1-1 services only provide a voice connection to a predetermined PSAP. Emergency responders do not gain any information other than what is provided by the caller. In contrast, Enhanced 9-1-1 (E9-1-1) automatically directs a call to the appropriate PSAP and identifies a caller's location and originating number in times of crisis.

When a PSAP receives a 9-1-1 call, there are two ways in which wireless carriers provide location information. The first uses global positioning systems (GPS) to provide the geo-coordinates, or precise longitude and latitude, of the caller.¹ This is commonly referred to as a "handset solution." The second uses triangulation from the cell towers themselves, or associated equipment, to calculate the caller's location. This is commonly referred to as a "network solution."

In the current environment, when 9-1-1 calls are made from wireless phones, the call may not be routed to the appropriate 9-1-1 center, and the call taker may not receive the callback phone number or the location of the caller. Life-threatening situations may arise when response time is delayed because callers are unable to speak, do not know where they are, do not know their wireless phone callback number, or the call is dropped.

In addition, the proliferation of wireless phones without the implementation of wireless E9-1-1 services is eroding the ability of emergency services to locate the caller and ensure the timely arrival of help. The increasing percentage of non-enhanced wireless 9-1-1 calls can be considered a critical degradation of our 9-1-1 system. Further, non-enhanced wireless 9-1-1 calls cause an extensive resource drain on PSAPs because they require extensive time, effort, and personnel to attempt to identify the caller's location.

Of the 150 million calls made to 9-1-1 in the year 2000, 45 million were made from wireless phones. This represents a ten-fold increase in wireless 9-1-1 calls from just ten years ago. Based on the projected rate of increase in wireless phone usage, most 9-1-1 calls will be made from wireless phones within the next five years.² Although many wireless phone subscribers buy their phones for safety reasons, they may be unaware that their wireless phones are not capable of providing 9-1-1 operators with Automatic Location Information (ALI) and Automatic Number Identification (ANI), like wire line phones do.

To address these concerns, the FCC passed rules in 1996 (Report and Order 94-102) that would provide 9-1-1 dispatchers with additional information on wireless 9-1-1 calls. There are two phases to the FCC's Wireless E9-1-1 Rules:

- Phase I provides the PSAP with the wireless phone call back number. This is important in the event the cell phone call is dropped. Phase I also provides the PSAP with the location of the cell tower that picked up the call. However, the large geographic coverage of most cell towers makes Phase I of minimal benefit to call-takers in locating emergency victims or callers. The deadline for Phase I was April 1, 1998 or within 6 months of being requested by the PSAP, whichever comes later.

- Phase II allows call-takers to receive both the caller's wireless phone number and specific location information accurate to within 50 to 100 meters, depending upon the technology used, i.e., handset or network. The deadline for wireless carriers to implement Phase II is December 31, 2005.³

As of October 2003, nearly 65 percent of PSAPs had Phase I wireless E9-1-1 service, while only 18 percent had Phase II. According to a General Accounting Office (GAO) report, 24 state 9-1-1 coordinators said that their state will have Phase II implementation by 2005 or sooner. All other state contacts estimated dates beyond 2005 or were unable to estimate a date.⁴

Closing the Emergency Communications Deployment Gap

State leadership is critical for E9-1-1 deployment. The GAO made clear that the "key factors hindering wireless E9-1-1 implementation involve funding and coordination."⁵ According to the GAO, the wireless carriers, states, and localities must devise the means to fund more than \$8 billion in estimated deployment costs. Most states require wireless carriers to collect funds from their subscribers through a surcharge included on subscribers' monthly wireless phone bills. Generally, the wireless carriers submit the funds to the states, and the states have the discretion to determine how the funds will be managed. Some states have established E9-1-1 boards that oversee the funds, while other states allow the funds to be managed at the county or PSAP level.⁶

Many of the PSAPs do not have adequate funding resources to purchase needed E9-1-1 equipment or have not received education or training on what they need to purchase to achieve compliance. At the same time, the wireless carrier industry has been working towards Phase II by upgrading their networks with enhanced location software capabilities and offering location equipped handsets to meet the December 31, 2005 deadline. E9-1-1 does not work unless both parties have the necessary software and equipment. If the majority of PSAPs do not have the ability to view specific location and callback number data, this will prevent the ubiquitous implementation of E9-1-1.

Challenges to Implementation

Implementing wireless E9-1-1 is a complicated process, requiring the effective, timely and willing cooperation of an array of stakeholders. Wireless E9-1-1 compliance requires upgrades in network infrastructure, new equipment and software, and training programs.⁷ Challenges to achieving compliance include lack of coordination, lack of an accurate assessment of PSAP progress, lack of adequate funding, and a need to provide training and education to PSAPs.

Lack of coordination among E9-1-1 stakeholders

The FCC Hatfield Report⁸ and the GAO report on the implementation of wireless E9-1-1 both cite the lack of coordination as one of the main reasons why the nation has been slow to implement. Because of the number of stakeholders involved in the process, including PSAPs, wireless carriers, state and local public safety agencies, and federal regulatory agencies, it is often difficult to coordinate activities among the various parties. In addition, a state E9-1-1 coordinator with little or no authority is not effective. Some

states that have statewide coordination have found that if leadership and oversight are lacking, the effort is unsuccessful. This lack of coordination creates other challenges as well, including less effective use of funding resources and a less organized approach to providing technical support to PSAPs

Lack of an accurate assessment as to the progress of PSAP implementation

While federal and state agencies as well as national organizations track E9-1-1 implementation among the PSAPs, there is no generally agreed upon method for assessing progress. For example, the U.S. Department of Transportation's (DOT) database on the status of implementation does not differentiate between PSAPs that will require equipment upgrades and those that will not.⁹ Few states have done assessments and for those that have, each has its own set of criteria. It would be difficult to aggregate this state-by-state data and have a true reflection of the current status of implementation. Without this critical assessment, it is for decision-makers to determine where resources should be allocated.

Lack of adequate and effective use of funding

The lack of funding for E9-1-1 implementation is a perennial issue. Although many states have created funds to assist in deployment, the GAO Report stated that \$8 billion would be needed to implement nationally. State and local governments do not have the resources to bridge this gap and are looking to the federal government to provide additional funding.

In the current environment, funding streams vary greatly from locality to locality hindering the ability to pool funding across jurisdictions that would create a more effective use of available funds. Many states collect surcharges on telephone usage into an E9-1-1 fund and then either disperse funds to individual PSAPs or provide funding once the PSAP has requested it. In some cases the PSAPs have not requested funds and the funds have been redirected for other uses. In the few states that have no wireless E9-1-1 fund, the PSAPs may have no ability to fund implementation. E9-1-1 implementation, like most government programs, is hard pressed to get adequate funding in tight budget times, and is complicated by the lack of understanding on how funding is collected and dispersed.

Need for PSAP training and education

PSAP readiness is hindered by a lack of training and education on how to successfully implement and deploy E9-1-1. It is difficult for individual PSAPs to address some of the technical challenges in upgrading location equipment and software, which can lead to costly project delays. States can assist PSAPs in streamlining deployment by providing technical resources. PSAP personnel need education concerning the wireless implementation process, including knowledge of the relevant FCC rules, implementation procedures, and technical resources.¹⁰

State Strategies to Accelerate Implementation

To counter these challenges, there are several strategies that Governors can employ to accelerate implementation. Many states have made significant progress in moving forward and several of these examples are cited in this section.

Designate a statewide coordinator who has authority and oversight of resources to effectively implement E9-1-1

Governors can help lead statewide implementation of wireless E9-1-1 by creating a designated point of contact for deployment, if one does not already exist. The E9-1-1 coordinator should have authority to oversee implementation, including the ability to pool statewide resources. The designee should provide support to the E9-1-1 governance board and act on their policy decisions, manage a coordination office that provides technical resources and training to PSAPs, and oversee implementation statewide.

Virginia has legislatively created a statewide coordinator for E9-1-1 appointed by the governor with a strong governance structure. The legislation provides for statewide coordination, employs a central staff, and establishes a board to allocate funding. The Wireless E9-1-1 Services Board promotes and assists in the statewide development, deployment, and maintenance of enhanced wireless emergency telecommunications services and technologies. The Board consists of the Chief Information Officer; Comptroller; Virginia Department of Emergency Management; Virginia State Police; local exchange carrier providing E9-1-1 service in Virginia; wireless service providers authorized to do business in Virginia; PSAP directors or managers; Virginia sheriff; chief of police; fire chief; emergency medical services manager; and a finance officer of a county, city, or town. This structure contributes to greater authority and accountability for implementing E9-1-1 statewide.¹¹

The **California** 9-1-1 Emergency Communications Office coordinates 9-1-1 system implementation statewide (California Government Code Section 53114). The statewide coordinating office authorizes and approves local implementation. It also funds the 9-1-1 network, database and customer premise equipment for 9-1-1 jurisdictions. The PSAPs provide authority to the state to allow the coordinating office to act on their behalf for some functions, such as wireless 9-1-1 coordination. The State 9-1-1 Advisory Board promotes communication between PSAPs and the California 9-1-1 Emergency Communications Office and advises the 9-1-1 Office on: policies, practices and procedures; technical and operational standards; training standards for 9-1-1 managers and county coordinators; budget, funding and reimbursement decisions; proposed studies and projects; and expediting the rollout of Phase II.¹²

The E9-1-1 Program Office in **Montana** is responsible for administering its 9-1-1 program on behalf of all local 9-1-1 jurisdictions. This statewide coordination office provides direction for the implementation of Basic 9-1-1 and E9-1-1 emergency telephone systems throughout the state and for upgrades and improvements to those systems once they are in place. It also administers the State 9-1-1 Emergency Telecommunications Account that disperses funds to the PSAPs. The Governor's 9-1-1 Advisory Council was created to provide an opportunity for various emergency and public safety organizations, telephone company representatives, local government officials, and the private sector to participate in the development, implementation, and management of the State's 9-1-1 Program. The 9-1-1 Program staff manages the department's statutory responsibilities for the development, implementation, and operation of 9-1-1 emergency telephone and public safety communications systems throughout the state.¹³

Vermont's E9-1-1 Board includes representatives from local government, state police, local police, county police, firefighters, emergency medical services, and the public. The Board is charged with designing, installing and overseeing the operation of statewide E9-1-1. The Board fulfills its responsibilities by maintaining and auditing the database, network, PSAP, and 9-1-1 operator components of the system; by

providing ongoing training and certification for 9-1-1 operators; and by maintaining a statewide E9-1-1 geographic information system (GIS) database. The enabling legislation gave the Board broad authority, including the authority to establish uniform, statewide 9-1-1 standards.¹⁴

Establish a baseline to determine where resources are needed to complete E9-1-1

One of the most important ways for Governors to close the deployment gap is to authorize their E9-1-1 coordinator to undertake an assessment of the current state of implementation. With this baseline information policymakers can make better decisions about where resources are needed most.

Montana has done an inventory of PSAPs and created a list of needed equipment. When funding becomes available, the state's 9-1-1 Program Manager can allocate resources according to spending priorities. Their assessment identifies the PSAPs that have basic 9-1-1 service and those that have E9-1-1. In **Massachusetts**, the Statewide Emergency Telecommunications Board first established technical and operational standards for PSAPs that utilize enhanced 9-1-1 network features. With these standards identified, an accurate assessment can be made of the PSAPs' progress.¹⁵

Several states use different criteria to assess the PSAPs' status. In **California**, the 9-1-1 office assesses progress by which cell sectors and carriers can provide service. **New York** tracks progress by county implementation for Phase I or II, with each county designating one PSAP for wireless calls. **Virginia** tracks carriers with Phase II and by the number of subscribers covered in a particular area.¹⁶

Identify opportunities to efficiently fund implementation

Although there is a critical shortfall in funds needed to complete implementation, states are finding innovative ways to stretch their current dollars. A primary concern of many state 9-1-1 program offices is to ensure that the funds collected are not redirected for other purposes, but used expeditiously by the PSAPs.

In **Montana**, the statewide public safety initiative pools resources into a centralized fund. Through this funding pool the state has greater purchasing power with vendors and is spending its resources more efficiently by using a centralized approach. As a result, the PSAPs are spending one-third of what they might have spent if they upgraded and maintained the equipment individually. In addition, PSAPs can only receive funds if they have filed a plan for implementation of E9-1-1 service. If they have not, this money is held in a Short-Term Investment Pool (STIP). In 2003 to ensure that PSAPs received their funds and that the STIP was not redirected for other purposes, the 9-1-1 Program office undertook an aggressive outreach program with the City and County commissions. Shortly thereafter, 29 additional PSAPs submitted plans and are now receiving funds.

In March 2001, **California's** 9-1-1 Program published a Request for Proposal (RFP) for 9-1-1 telephone answering equipment. The goal of this RFP was to establish a Master Purchase Agreement (MPA) whereby PSAPs can purchase 9-1-1 equipment and services from a list of vendors who meet detailed service requirements and provide equipment that comply with specifications, all at competitively bid prices. This equipment, paid for by taxpayers through a telephone bill surcharge, is extremely expensive costing millions of dollars per year. Previously, the average price of a five-position 9-1-1 telephone system

was \$440,000 and sometimes as high as \$560,000. Bid proposals varied from \$146,000 to \$310,000, with an average of \$235,000. This represents a 53 percent decrease in the average cost of a five-position 9-1-1 system. With a term of three years and two one-year renewal options, this contract has the potential to result in a \$10 million to \$20 million decrease in the cost for 9-1-1 equipment and services over the life of the contract.¹⁷

In **Virginia**, localities request funds by applying to the Wireless 9-1-1 Service Board. All applications are screened by the Virginia Information Technologies Agency (VITA) staff and are presented to the Board for approval. This process allows the Board to disperse funds more efficiently and look for opportunities where resources can be shared or pooled for greater purchasing power. Once the Board grants approval, funds are disbursed to the localities for expenditure. The localities then submit invoice verification proving that the funds were spent on the items outlined in the application request.¹⁸

Provide education and outreach to PSAPs to assist them with implementation

Many states and national organizations provide education and outreach to PSAPs to help them identify their equipment upgrade needs. State coordinators also provide on-site technical assistance to PSAPs educating them about their responsibilities, bringing parties together to discuss implementation issues, and providing a single point of contact. The National Emergency Number Association (NENA) has assembled information and developed materials for this purpose which is available on their website.¹⁹ In addition, the Association of Public Safety Communications Officials (APCO) International will be releasing a CD-Rom in May 2004 that provides states and localities with tools for implementation.²⁰

There are several state coordination offices that offer training and education programs to the PSAPs. For example, **Washington's** E9-1-1 Unit of the Emergency Management Division works with counties and communications companies to ensure the E9-1-1 system is operational and available to all the citizens. The Unit provides technical assistance on the acquisition and installation of equipment and linking both public and private telephone systems to the E9-1-1 system. Other assistance provided to counties includes training, contingency planning, and public education.²¹

Virginia has provided funding to the PSAPs for project management, consulting, and training. In addition VITA mediates disputes with wireless carriers on behalf of the PSAPs. VITA produced a Wireless E9-1-1 implementation guide to assist localities, which includes sample RFPs, contracts, and ordinances. Using this technical assistance the first PSAP to finish Phase II implementation was a rural area with approximately 25,000 in population.

Conclusion

Accelerating the implementation of wireless E9-1-1 will require leadership, political will, empowerment of a statewide coordinator, and the allocation of resources. Governors should ask the following questions: *Is there political will to make Phase II a reality by December 31, 2005? Is there a statewide coordinator that is empowered to oversee implementation in the most effective and cost-efficient way possible? Have the PSAPs been given incentives that will assist them with implementation?* The end result of successful E9-1-1 deployment will be improved emergency response capabilities for PSAPs that will save lives.

¹ State of Vermont. “9-1-1 for Everyone.” Retrieved April 15, 2004, from <http://www.state.vt.us/e9-1-1/InfoAndEducation/E9-1-1GIS.htm>.

² National Emergency Number Association. “Wireless 9-1-1 Overview.” Retrieved April 23, 2004, from www.nena.org/wireless911/overview.htm.

³ State of Montana. “Wireless E9-1-1 Deployment” (fact sheet). Originally the Phase II deadline was set for October 1, 2001.

⁴ U.S. General Accounting Office (GAO). “*Uneven Implementation of Wireless Enhanced 9-1-1 Raises Prospect of Piecemeal Availability for Years to Come*” (Washington, DC: November 2003). Retrieved April 15, 2004, from www.gao.gov/cgi-bin/getrpt?GAO-04-55.

⁵ U.S. GAO, *Uneven Implementation*, November 2003.

⁶ U.S. GAO, *Uneven Implementation*, November 2003, pp. 18.

⁷ E9-1-1 Institute. “The Issues.” Retrieved April 15, 2004, from <http://www.e9-1-1institute.org/theIssues/index.html>.

⁸ Dale N. Hatfield, *A Report on the Technical and Operational Issues Impacting the Provision of Wireless Enhanced 9-1-1 Services*, October 2002, FCC WT Docket No. 02-46.

⁹ U.S. GAO, *Uneven Implementation*, November 2003.

¹⁰ *Wireless E9-1-1 Initiative National Summit*. Briefing Book prepared for the Wireless E9-1-1 Steering Council, April 8, 2002.

¹¹ Commonwealth of Virginia. “Wireless E9-1-1 Legislation. Code of Virginia §56-484.12-18.” Retrieved April 15, 2004, from http://www.9-1-1.virginia.gov/wireless_legislation.htm.

¹² State of California. “California Emergency Services Advisory Board.” Retrieved April 15, 2004, from <http://www.td.dgs.ca.gov/Services/9-1-1/cesab.htm>.

¹³ State of Montana. “Public Safety Services 9-1-1 Program.” Retrieved April 15, 2004, from <http://www.discoveringmontana.com/itsd/techmt/publicsafety/>

¹⁴ State of Vermont. “Enhanced 9-1-1.” Retrieved April 15, 2004, from <http://www.state.vt.us/e9-1-1>.

¹⁵ Commonwealth of Massachusetts. “Wireless E9-1-1 Legislation.” Retrieved April 15, 2004, from <http://www.state.ma.us/e9-1-1/legislation.htm>.

¹⁶ The lack of standardization in assessing progress makes it difficult to accurately evaluate where states are in implementation. DOT/NENA has a national database that receives information filed by the wireless carriers on a quarterly basis. However, the total number of PSAPs that need to be upgraded is unknown. Proposed legislation calls for the creation of a national coordination office headed by DOT and the Department of Commerce’s National Telecommunications and Information Administration (NTIA) which may provide assistance in developing criteria.

¹⁷ State of California. “Department of General Services Master Purchase Agreement DGS-1126-(01-10).” Retrieved April 15, 2004, from <http://www.td.dgs.ca.gov/Services/9-1-1/mpa-dgs-0026-%2801-10%29.htm>.

¹⁸ Virginia Information Technologies Agency. “9-1-1 Services.” Retrieved April 15, 2004, from <http://www.vita.virginia.gov/services/voiceServices/e9-1-1.cfm>.

¹⁹ NENA provides resources on Wireless E9-1-1 planning, implementation, and operations. Retrieved April 23, 2004, from <http://www.nena.org/Wireless911/index.htm>.

²⁰ Association of Public-Safety Communications Officials (APCO) International. “Wireless 9-1-1.” Retrieved April 15, 2004, from <http://www.apcointl.org/about/gov/wireless.html>.

²¹ State of Washington. Military Department Emergency Management Division. “State Enhanced 9-1-1 (E9-1-1) Unit.” Retrieved April 15, 2004, from <http://www.emd.wa.gov/2-e9-1-1/9-1-1-idx.htm>.